

# United States Patent [19]

Ellis et al.

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[54] NUCLEIC ACID PROBES FOR PRENATAL SEXING

[75] Inventors: Steven B. Ellis, La Jolla; Michael M. Harpold, San Diego, both of Calif.

[73] Assignee: The Salk Institute Biotechnology Industrial Associates, Inc., San Diego, Calif.

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## Related U.S. Application Data

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436/814; 536/27; 935/3, 9, 63, 78

## References Cited

## FOREIGN PATENT DOCUMENTS

8600342 1/1986 World Int. Prop. O.

## OTHER PUBLICATIONS

Nallaseth, F. S. et al., "Isolation of Recombinant . . .

Male-Specific M use DNA", M. I. Gen. Genet 190, 80-84 (1983).

Gosden, J. R. et al., "Rapid Fetal Sex Determination . . ." The Lancet 1, 540-541, Mar. 10, 1984.

Burns, J. et al., "Sensitive System for Visualizing . . ." J. Clin. Pathol 38, 1085-1092 (1985).

Bishop et al., "Single Copy DNA Sequences Specific for the Human Y Chromosome", Nature 303, 831-832 (1983).

Kunkel et al., "Organization and Heterogeneity of Sequences", Biochemistry 18, 3343-3353 (1979).

Langer, P. R. et al., "Enzymatic Synthesis of Biotin-Labeled Polynucleotides . . .", Proc. Natl. Acad. Sci. U.S.A. 78(11), 6633-6637 (Nov., 1981).

Lamar et al., "Y-encoded Species-Specific DNA in Mice . . .", Cell 37, 171-177 (1984).

Primary Examiner—Robert J. Warden

Assistant Examiner—Richard Wagner

Attorney, Agent, or Firm—Fitch, Even, Tabin & Flannery

## [57] ABSTRACT

Nucleic acid hybridization probes are provided which have sequences complementary to sequences of segments in bovine male-specific DNA and are suitable for sexing bovine embryos at the time of embryo transfer with nearly 100% accuracy.

33 Claims, 4 Drawing Sheets